Remarks/Arguments

Claims 1-4, 10 and 22 stand rejected.

Claim 5 is objected to as being dependent upon a non-allowed base claim.

Claim 5 has been re-written in independent form to include the subject matter of base claim 1. Claim 5 is now believed to be allowable.

Claims 2 and 3 have been amended as suggested by the examiner and are now believed to be in proper form.

Claims 1 and 22, along with dependent claims 2-4 and 10, are now rejected under 35 USC 103(a) as unpatentable over DeAngelis, et al, in view of Patel, et al.

The rejection states that DeAngelis teaches a yarn comprising a core primary component and a secondary component comprising a blend of a single polymeric material and electrical conductors such as conductive carbon fibers. The secondary component is bonded with the primary component along its length.

The rejection acknowledges DeAngelis does not teach the use of carbon nanotubes as the conductive component nor does it teach the use of a conductive component in the amount of no more than .5% of the multi-component yarn.

Patel, et al, earlier applied, is said to teach conductive polymer components comprising polymeric resins and electrically conductive filler materials, to include carbon nanotubes in amounts as low as .025 wt %.

The rejection contends this teaching would have been motivation to the skilled artisan to modify the teachings of DeAngelis to use carbon nanotubes instead of carbon black.

The rejection stipulates that DeAngelis is silent as to the amount of the sheath material present in the yarn. Nevertheless, the position is taken that it would have been obvious to determine and modify this amount during routine experimentation.

This latter position is totally unfounded as it is unmotivated by any disclosure of either DeAngelis or Patel. The position of obviousness is, therefore, traversed as improper and unfounded.

Turning now to the reference Patel, et al, '572. The patent is directed to a composition comprising a conductive polymeric resin, an electrically conductive filler and an antistatic agent. The examples presented disclose a composition usable in processes such as injection molding and blow molding. The reference does not disclose a yarn formed in part with the disclosed conductive resin such as by extruding or by coating an extruded filament.

The conductive composition, as disclosed in the examples, all contain carbon fibers and an antistatic agent. The specification states that only when both carbon fibers and antistatic agent are present can the desired results of a low overage reading and low standard deviation be met. See column 9, lines 29-43. All claims recite the composition to include an antistatic agent.

No disclosure is directed to the formation of a composite yarn nor to the use of carbon nanotubes as an element of a multi-component fiber or filament.

It is argued that no motivation exists to take any teaching for the formation of a conductive filler composition and incorporate such teaching to the formation of a multi-component fiber or yarn.

The reference to DeAngelis, et al, '421 is directed to an electrically resistive yarn which comprises a core 100, a sheath 200 and an insulator 300. The sheath includes conductors 210 and matrix 220. The sheath 200 is disclosed as a material that provides increased electrical resistance with increased temperature.

The reference does not disclose the use of carbon nanotubes as conductors and provides no % carbon nanotube combined with filler nor with the multi-component yarn. The reference does not disclose as an object to provide a multi-component conductive yarn which is not brittle, is resilient and flexible. There is no reference to the core yarn being set.

The reference is directed to forming a matrix of low conductive material combined with electrical conductors. The conductors provide an electrically conductive pathway through the sheath while the matrix material has a higher co-efficient of expansion.

Again, no motivation exists to combine the references. There is no motivation to try and limit the % conductive material within the matrix, no motivation to employ carbon nanotubes and no motivation to select the claimed % sheath material in the multi-component yarn.

Claim 1 calls for a multi-component conductive yarn comprising a primary component consisting of at least one set polymeric filament formed of a single polymeric material.

DeAngelis does not disclose the core so constructed. The reference states the core may be a synthetic yarn, of natural fibers, may be mono or multi-filament and shaped. The reference does not call for a core yarn which is set.

The claim calls for a secondary component consisting solely of said polymeric material unset and carbon nanotubes. The carbon nanotubes constitute up to .5% of the multi-component yarn.

DeAngelis does not discose carbon nanotubes.

Patel does not disclose a yarn but rather a composition. The reference does not state whether the composition is set or unset. The reference cannot disclose a % carbon nanotube relative a composite yarn as no composite yarn is disclosed.

For these reasons, it is believed that claim 1 defines over the rejection set forth.

Claims 2, 3, 4 and 10 depend from claim 1 and are believed to be also allowable.

Claim 22 calls for a primary component of at least one set elongated filament of a single polymeric material.

Neither reference of the rejection discloses such a component.

The claim calls for a secondary component comprising a blend of carbon nanotubes of between .5% and 10% and unset polymeric material of between 90% to 99.5%.

Neither reference provides for unset polymeric material in the claimed % range.

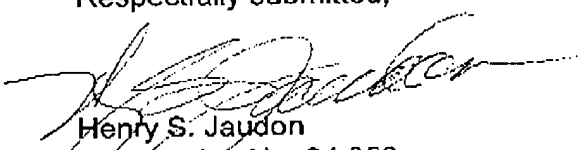
The claim calls for the secondary component as being bonded with the exterior of the primary component along its length and comprising between .5% and 10% wt. of the multi-component yarn.

It is noted in the rejection that this range is not taught by DeAngelis. It is argued that nothing in the disclosure of DeAngelis would make it obvious to even attempt to find this range for the sheath much less a sheath comprised of .5% to 10% carbon nanotubes and between 90% and 99.5% set polymeric material.

For these reasons, it is believed claim 23 clearly defines over the reference of the rejection.

An earnest effort has been made to overcome the rejections and place the claims in allowable condition. It is respectfully requested that upon reconsideration, the examiner find the claims to be allowable and pass the case to issue in due course of PTO business.

Respectfully submitted,



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